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Energy use behavior: A window of opportunity

The environmental impact of electric vehicles depends on the kind of energy used to charge them. However, electric vehicles are typically charged at peak times, when fossil fuels are required to meet energy demands. A study shows that emails targeting electric vehicle charging for new owners can be effective for promoting greener charging behaviors.

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Few people think about how and where their electricity comes from when they switch on a light or boil water to make a hot drink. In the United Kingdom, just over 50% of electricity consumed is made from burning fossil fuels such as coal and gas; approximately 21% is from nuclear energy reactors; and 25% is from renewable sources such as wind, solar and hydro[1]. The use of renewable energy to make electricity has been increasing, however when demand for electricity peaks (often in the morning and late afternoon), power plants that burn fossil fuels are relied upon to meet the surge in demand, which consequently increases levels of carbon emissions. Sizeable reductions in levels of carbon emissions are achievable if effective interventions can be found that encourage the public to use electricity at off-peak times, when fossil fuels are not used to meet demand, whenever possible. Writing in *Nature Energy,* Moira Nicolson and colleagues at University College London show that tailored emails can nudge new electric vehicle (EV) owners to engage with information about switching to a tariff scheme that incentivizes vehicle charging during off-peak hours[2].

Nicolson and colleagues delivered two persuasive communications via emails to over 7000 EV customers in the UK who had purchased their vehicle within the last four years. The recipients were randomly assigned to receive either a general message advising that £300 could be saved on household energy bills (generic email) or on EV charging costs (tailored email) by switching their energy and time of use tariff. Approximately 40% of all participants opened the emails, but, importantly, the open rate was 15% higher for the tailored email compared to the generic email. Furthermore, twice as many people in the tailored group compared to the generic group went on to visit a website to get further advice on switching tariff and the best time to charge their EV. Another important finding was that email open rates declined from over 70% immediately after EV purchase to 40% for those who owned their EV for more than three months.

The email intervention employed by Nicolson and colleagues leverages two principles that have been shown to promote and facilitate behaviour change. The first is that describing a tailored and concrete behaviour (e.g., EV charging) in a behaviour change message is more effective than targeting generic behaviours (e.g., "conserve energy") because it clearly articulates specific action that will provide a financial reward[3]. In this case, that information was particularly relevant to the intended audience as they had already made an investment in an EV. The second principle is that a significant life course change creates a window of opportunity, which can last up to three months[1], during which time efforts to change behaviours are more successful because people have to pay attention to and consciously think about what it is they will have to do differently[4,5]. Through their study, Nicolson and colleagues showed that EV charging is a behaviour that benefits from specific targeting, and

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that EV purchase may constitute a significant life change that is subject to a window of opportunity during which behaviour change interventions can be more effective.

As governments increasingly administer services electronically, their departments are building large databases about individuals. Nicolson and colleagues obtained their list of EV owners from such a government database, composed of individuals who obtained a £5000 government grant— the 'Plug in Car Grant'—because they had purchased an EV. The availability of this database allowed Nicolson and colleagues to reach approximately 10% of private EV owners in the UK. This demonstrates that governments can be valuable partners and conduits of practical and simple messages about the financial benefits of making small more sustainable lifestyle changes.

The EV charging behaviour targeted by Nicolson and colleagues is limited in reach to those who can afford a brand new EV and who were registered on the Plug in Car Grant scheme database. However, a similar strategy could generalise to other drivers and make the behaviour targeted by intervention more broadly relevant across the socioeconomic spectrum. For example, drivers could be advised after any recent life course change that monetary savings on petrol or gas bills are possible through simply reducing their speed and ensuring they have the correct pressure in their tyres (so-called 'eco driving'). In fact, some car manufacturers are already including feedback technology in their cars advising of how much money is being saved by eco-driving[6]. Emphasizing the financial savings that can be made from changes to habits and routines may be of particular interest to those who may be on low income[7].

While success in achieving behaviour change in the form of a switch in tariff was not measured in this study, Nicolson and colleagues nonetheless provide evidence for an effective, easy to implement, intervention that, as they note, could result in 135,000 people switching tariff once EVs reach 60% market penetration if only 5% of those who open the email go on to switch tariff. But such success depends on implementing action soon, before any window of opportunity has closed.

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